

Decision Document and Permit

**Application
from Augean South Limited
made under the
Environmental Permitting (England and Wales)
Regulations 2010
to dispose of radioactive waste
at**

**East Northants Resource Management Facility,
Stamford Road,
Kings Cliffe,
Northamptonshire,
PE8 6XX**

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Decision Document

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Legislation update and transitional arrangements

- i The application by Augean South Limited (Augean) for the disposal of radioactive waste was made under the Radioactive Substances Act 1993 (RSA 93) on 20th July 2009. Consultations took place under RSA 93 in relation to the application from 5th August 2009 to 18th September 2009 and from 19th February 2010 to 12th March 2010. Subsequently, on 6th April 2010 much of RSA 93 was repealed¹ in England and Wales and replaced by the Environmental Permitting (England and Wales) Regulations 2010 (EPR). Radioactive substances regulation is specifically addressed in Schedule 23 of the EPR.

The EPR make specific provision under regulation 75 for applications which were commenced under RSA 93, but have not yet been determined (a transitional application). Anything done in relation to a transitional application is taken to have been done under the EPR. The references in this document (including the title on the front page) are therefore to the EPR rather than RSA 93. The EPR contain specific provisions which relate to public participation in relation to applications for permits. These provisions do not apply to transitional applications concerning activities involving radioactive substances.

- ii. The EPR have introduced new terminology. Under RSA 93 a permit for the disposal of radioactive waste was described as an "authorisation". Under the EPR such a permit is described as an "environmental permit" and the activity of disposing of radioactive waste is described as a "radioactive substances activity". We have adopted this terminology in this Decision Document.

The EPR have also introduced specific requirements relating to permits for radioactive substances activities. In particular, under RSA 93 the legislation provided that permits should be posted in an appropriate position on the premises. Under the EPR this requirement must be included as a condition within the permit, subject to certain exceptions which do not apply to Augean's permit. Additionally, under RSA 93 where an authorisation was granted or varied, a copy had to be sent to each local authority in whose area radioactive waste was to be disposed of or accumulated. As these requirements no longer exist under the EPR, the Government has issued guidance advising the Environment Agency that new environmental permits for sites undertaking the final disposal of radioactive waste should contain a condition requiring the operator to inform the relevant local authority before the operator first receives radioactive waste from any new consignor (see paragraphs 4.31-4.34 of the Environmental Permitting Guidance, Radioactive Substances Regulation for the Environmental Permitting (England and Wales) Regulations 2010, March 2010, version 1.1). Appropriate provisions reflecting the new requirements have therefore been included in the final version of Augean's permit to dispose of radioactive waste.

- iii In 2009 the Government also issued Statutory Guidance to the Environment Agency concerning the regulation of radioactive discharges to the environment (the Statutory Guidance). The main focus of the Statutory Guidance is the change from Best Practicable Means (BPM) and Best Practicable Environmental Option (BPEO) to Best Available Techniques (BAT). BAT replaces BPM and BPEO in order to ensure the terminology used is consistent with environmental protection terminology used in England, Wales and other countries. BAT is expected to deliver the equivalent level of environmental protection as achieved previously by the use of BPM and BPEO. Paragraphs 12-14 of the Statutory Guidance explain this further. The conditions of the environmental permit have therefore been amended to reflect this change.

¹ The following provisions of RSA 93 remain in force: sections 8(4-7); 11(1-2); 15(1), (1A)-(1C), (2); 40; 44(1), (3)-(5), 47, 49; 50; 51 Schedule 3, Part 1 (note that para 9 has been amended) and Schedule 5.

1 Summary

- 1.1 The Environment Agency has responsibility under the EPR for regulating all disposals of radioactive waste on or from both nuclear and non-nuclear sites in England and Wales. Under the EPR "disposals" of radioactive waste include discharges into the air, water, sewer or drain, burial (whether underground or otherwise) and transfers to other sites. We regulate the disposal of radioactive waste through an overall system of regulatory control that is underpinned by issuing permits under the EPR to operators at each applicable site. These permits specify the conditions that we impose on the disposal of radioactive waste.
- 1.2 We have prepared this Decision Document in relation to an application by Augean for a permit to dispose of solid Low Level Radioactive Waste (LLW) at the East Northants Resource Management Facility (ENRMF).
- 1.3 The ENRMF is an existing permitted hazardous waste landfill site that lies approximately 2.5km north of the village of King's Cliffe in the East Northamptonshire District of the County of Northamptonshire. The closest village to the site is Duddington, approximately 2.2km north-west of the site. The ENRMF is presently permitted to receive hazardous wastes up to 249,999 tonnes per year under permit no. EPR/TP3430GW. The application from Augean sought permission to dispose of solid LLW of up to 200Bq/g (200 becquerels per gramme) including High Volume Very Low Level Radioactive Waste (HV-VLLW). Typically this LLW will originate from the decommissioning of nuclear sites.
- 1.4 We have sought views to assist us in making our decision. We initially consulted on the application from 5th August 2009 to 18th September 2009. Views were received following this consultation which were taken into account prior to the publication of our Explanatory Document which described our '*minded to*' issue position and contained a copy of a proposed permit. The Explanatory Document was issued for consultation from 19th February 2010 to 12th March 2010. Responses from this consultation have been grouped for common themes and included in our considerations and assessment at section 4.
- 1.5 The dose assessments submitted by Augean have been considered. We decided to apply further precaution to the proposed concentrations of radioactivity in waste² if mixed with soil when the site is closed and no longer managed. As a consequence we concluded that we would reduce the radiological limits requested by Augean to approximately an eighteenth of those requested.

	Applied for ³	Granted
Maximum total radiological capacity ⁴	313 TBq	17 TBq

- 1.6 After having taken into account the responses to the consultation and all other relevant considerations, we have decided to issue Augean an environmental permit for the disposal of LLW up to a maximum activity of 200Bq/g for the ENRMF. A copy of the permit is attached at Annex 3. We are satisfied that the measures taken by Augean in relation to the disposal of LLW at the ENRMF and any radiation doses received by the public and environment satisfy all relevant legal, policy and regulatory considerations to ensure that people and the environment are properly protected. The reasons for our decision are set out at section 4.

² Augean had proposed a 1 to 10,000 dilution of waste to soil in the unlikely event that the waste was excavated for agricultural reasons. We have calculated doses using a 1 to 10 dilution since it would be reasonable to assume that mixing waste with anything less than 90% soil would be unusable for agricultural purposes. Assumptions regarding the quantity of material that might inadvertently be excavated at some point in the future; the area over which that material would be spread; the relative proportions of soil and waste in the material that is spread; the extent to which crops would be grown on it and resultant produce consumed are factors that contribute to the derivation of radiological capacity.

³ TBq means terabecquerels, having a numerical value of 1×10^{12} or 1,000,000,000,000 becquerels

⁴ For full radionuclide and individual radionuclide capacity/limits see Table at section 5.

2 Site details and the application

Introduction

- 2.1** This section provides information about Augean's ENRMF site. It includes a summary description of the site, including the activities carried out, its location and it identifies nearby environmentally sensitive areas. It provides a brief description of how radioactive wastes will be disposed of. It summarises key requests included in the Augean application for ENRMF.

ENRMF

- 2.2** The ENRMF is an existing permitted hazardous waste landfill site that lies approximately 2.5km north of the village of King's Cliffe in the East Northamptonshire District of the County of Northamptonshire. The closest village to the site is Duddington, approximately 2.2km north-west of the site. The ENRMF is a landfill site presently permitted to receive hazardous wastes up to 249,999 tonnes per year under permit no. EPR/TP3430GW. The application from Augean is for a permit to dispose of solid LLW of up to 200Bq/g including HV-VLLW.

Conservation sites in the vicinity of the ENRMF

- 2.3** There are two Natural Nature Reserves (NNR) both with Sites of Special Scientific Interest (SSSI) designations located near to the site. Closely bordering to the north and north-east of the site is the 151.5 hectare Collyweston Great Wood and Easton Hornstocks SSSI and approximately 2km to the east is the 30.8 hectare Bedford Purlieus SSSI.

Augean's application - key points

- 2.4** As stated above, Augean applied for a permit to dispose of solid LLW of up to 200Bq/g including HV-VLLW. Augean did not specify the precise origin of the radioactive waste, and were generic in their proposals in order to be able to dispose of radioactive wastes from various sources such as the nuclear industry and from non-nuclear facilities such as hospitals, universities and research establishments.
- 2.5** The amount of LLW that can be disposed of to the ENRMF is constrained by the physical capacity of the site (a maximum tonnage limit of waste and engineering cover material exists of 249,999 tonnes per year which is a condition in their current environmental permit) and the radiological capacity of the site (the amount of radioactivity it can take is expressed as the quantity of each radionuclide that the site can take over its lifetime expressed as becquerels).
- 2.6** Augean proposed to dispose of the radioactive wastes in enclosed double bags or enclosed steel drums.
- 2.7** No other permits for the disposal of radioactive waste are held by Augean at the ENRMF.

3 The process we followed to determine the application

3.1 Operators can apply to the Environment Agency for a new permit or a variation to an existing permit at any time. The process we have followed in assessing Augean's application is summarised in Table 1 below.

Table 1 : Overview of the process to determine the application		
Phase		Comment
1	Information gathering	When we set out our requirements and gathered information relevant to our considerations, including receipt of an application
2	Initial Consultation	When we consulted appropriately on the application
3	Post Consultation Review	When we carefully considered all relevant information we received during and after consultation together with existing information
4	Preliminary View	When we came to a view on whether a new environmental permit should be issued and if so what its limitations and conditions should be.
5	Further Consultation	When we consulted on our preliminary view. We set out a draft permit together with an explanatory document explaining our preliminary view and we consulted appropriately.
6	Post Consultation Review	When we carefully considered all relevant information we had received during and after consultation together with existing information.
7	Decision and Permit <i>(This document reflects this stage of the process)</i>	When we came to a view that a new environmental permit should be issued and what its limitations and conditions should be. We are publishing this Decision Document to provide the background to and basis for, our decision.

3.2 The Environment Agency received Augean's application for a permit to dispose of solid LLW at the ENRMF on 20th July 2009. We sent copies of the application to the local public registers for the site (listed in Annex 1) and, for consultation purposes, to the Food Standards Agency, Health and Safety Executive (HSE), Northamptonshire County Council and East Northants District Council. Copies of the application were also sent to local stakeholders, namely the interest group Wastewatchers, and Kings Cliffe Parish Council for information and inviting comments. We initially consulted on the application from 5th August 2009 to 18th September 2009. We wrote to Augean on 15th October 2009 requesting further information. We received a satisfactory response from Augean on 12th November 2009. This further information response was distributed to those parties who had already received copies of the application and relevant public registers. Views from the application consultation, together with the further information received, were taken into account prior to the publication of our Explanatory Document. The Explanatory Document described our '*minded to*' issue, or preliminary position, and contained a copy of a proposed permit. The Explanatory Document was issued for consultation from 19th February 2010 to 12th March 2010 to the parties who had received the application consultation, and a copy was also placed on our website.

3.3 A summary of certain key considerations we have taken into account before reaching our decision and relevant documentation is set out in the table below. Further information is provided in section 4 of this Document where we explain how we have reached our decision against these and other relevant considerations.

Considerations	Documentation
Euratom Article 37 – A favourable opinion has been received from the EC	Commission Recommendation of 6 December 1999 Annex 2 – copy of opinion received
Government Policy	Policy for the long-term management of solid low-level radioactive waste in the United Kingdom. DEFRA, DTI and the Devolved Administrations. March 2007 (LLW Policy)
National Strategy for LLW management	UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry
Disposal of radioactive waste and BAT	Statutory Guidance to the Environment Agency concerning the regulation of radioactive discharges into the environment; Near-surface Disposal Facilities on Land for Solid Radioactive Wastes. Guidance on Requirements for Authorisation, Environment Agency, Scottish Environment Protection Agency, Northern Ireland Environment Agency, February 2009 (GRA)
Radiological assessments	Assessing the capability of controlled landfills to accept the disposal of solid low-level radioactive waste. SNIFFER. UKRSR03. 2006. (SNIFFER); HPA-RPD-020 - Radiological Assessment of Disposal of Large Quantities of Very Low Level Waste in Landfill Sites;
Disposal routes and monitoring	RSR RGN1 Radioactive Substances Regulation – Environmental Principles
Statutory requirements	RGN 4 Setting standards for environmental permitting
Operator and operator competence	RGN 5 Operator Competence

3.4 Some respondents to the consultation queried the way in which the consultation had been conducted.

3.5 **Consultation response:** A respondent queried why we did not consult with Anglian Water about the proposal to dispose of radioactive waste to the ENRMF.

Our response: The consultation was conducted when the relevant provisions of RSA 93 was still in force. Section 18(1) of RSA 93 states:

If, in considering an application for an authorisation under section 13, it appears to the appropriate Agency that the disposal of radioactive waste to which the application relates is likely to involve the need for special precautions to be taken by a local authority, relevant water body or other public or local authority, the appropriate Agency shall consult with that public or local authority before granting the authorisation.

Doses to the public are well within the necessary constraints and we consider that no special precautions need to be taken by the water body – therefore consultation with Anglian Water was not necessary.

3.6 **Consultation response:** Why did the Environment Agency not consult with the Department for Transport with respect to packaging, transport and labelling of the radioactive waste.

Our response: We do not have powers to regulate the packaging, transport and labelling of radioactive waste. It is the responsibility of the consigning site to adhere to the relevant transport regulations which are regulated by the Department of Transport.

3.7 **Consultation response:** Should the Environment Agency consult with the NDA since the NDA are tasked to deliver a UK LLW Strategy?

Our response: We recognise that the NDA have recently published the UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry. One aim of the strategy is to make best use of the Low Level Waste Repository in Cumbria by ensuring that only those wastes requiring enhanced safety, security and environmental protection through engineered multi-barrier containment are consigned to that site for disposal. The

strategy states that disposal to landfills may also be considered for some LLW, adding that this may be delivered through the supply chain. Augean's proposals are consistent with the UK LLW Strategy. We have no legal requirement to consult with NDA on our decision and do not feel that there is a benefit from doing so.

3.8 Consultation response: *The consultation process has not been adequate.*

Our response: *We have gone beyond the requirements of the relevant legislation in consulting with local communities and stakeholders. We designed and followed a proportionate process to engage stakeholders at the application receipt stage as well consulting on the explanatory document. We have taken into account the responses made to the consultation as set out in this document.*

3.9 We re-considered our preliminary decision against the responses received following the second consultation, before proceeding to a final decision. In section 4 of this document we explain how we have reached our decision against these and all other relevant considerations. We will place both the permit we issue and the reasons for our decision on the public register.

3.10 We keep the regulatory systems and processes that we use under review. The provision of this Decision Document contributes to our aim that our regulatory work will be:

- Transparent** - by having rules and processes which are clear to those in business and local communities;
- Accountable** - by explaining ourselves and our performance;
- Consistent** - by applying the same approach where possible within and between sectors and over time;
- Proportionate** - (or risk-based) by allocating resources according to the risks involved and the scale of outcomes which can be achieved;
- Targeted** - (or outcome-focused) by having environmental outcomes central to our planning and in assessing our performance.

3.11 While we will normally determine an application, the Secretary of State can require any application to be sent to him for determination (regulation 62 of the EPR). As noted in the Core guidance this would be an exceptional step and likely to be taken only if the application involves issues of more than local importance. The Secretary of State did not "call in" this application.

4. Our considerations and assessment

- 4.1 In order to decide whether to issue an environmental permit we have to consider all relevant information available to us following the process as described in section 3.
- 4.2 In reaching our decision we have taken into account the information supplied by Augean, the consultation responses, together with relevant legislation, Government policy and guidance, our own guidance and assessments. This section sets out the legal and policy issues that we have taken into account.

Government policy

Radioactive Waste Management – low-level, solid radioactive waste

- 4.3 We have considered the Government 'Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom' published in March 2007. This policy amends or replaces relevant parts of the 'Review of Radioactive Waste Policy: Final Conclusions (Cm2919) White Paper published in July 1995. The Government states that it sees no reason to preclude controlled burial of radioactive waste from nuclear sites from the list of options to be considered in any options assessment, provided the necessary safety assessments can be carried out to the satisfaction of the environmental regulators. The application from Augean is consistent with current Government Policy.

UK Strategy for the management of solid low level radioactive waste from the nuclear industry

- 4.4 We have considered the recently published the 'UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry'. One aim of the strategy is to make best use of the Low Level Waste Repository in Cumbria by ensuring that only those wastes requiring enhanced safety, security and environmental protection through engineered multi-barrier containment are consigned to that site for disposal. The Strategy recognises the contribution that alternative sites, including landfills, will provide. It does not set out to prescribe which disposal options or sites will be preferred, but recognises the role that the supply chain may make. The application from Augean is consistent with the approach in this Strategy.
- 4.5 The Strategy states that "disposal of LLW to landfill by means of controlled burial may be considered provided the necessary safety assessments can be carried out to the satisfaction of the environmental regulators". We have been provided with a safety assessment and have considered this in some detail. We are satisfied with the safety assessment.

Radioactive waste management - BAT

- 4.6 In 2009 the Government issued Statutory Guidance to the Environment Agency concerning the regulation of radioactive discharges to the environment (the Statutory Guidance). The main focus of the Statutory Guidance is the change from Best practicable means (BPM) and Best Practicable Environmental Option (BPEO) to Best Available Techniques (BAT). BAT replaces BPM and BPEO in order to ensure the terminology used is consistent with environmental protection terminology used in England, Wales and other countries. BAT is expected to deliver the equivalent level of environmental protection as achieved previously by the use of BPM and BPEO. Paragraphs 12-14 of the Statutory Guidance explain this further. The application of BAT is explained in more detail at paragraphs 4.15 to 4.19 below.

Legislation

The Environmental Permitting (England Wales) Regulations 2010 (EPR)

4.7 The Environment Agency has responsibility under the EPR for regulating all disposals of radioactive waste on or from both nuclear and non-nuclear sites in England and Wales. Under the EPR "disposals" of radioactive waste include discharges into the air, water, sewer or drain, burial (whether underground or otherwise) and transfers to other sites. We regulate the disposal of radioactive waste through an overall system of regulatory control that is underpinned by issuing permits under the EPR to operators at each applicable site. These permits specify the conditions that we impose on the disposal of radioactive waste.

Operator and operator competence

4.8 We must not grant a permit if we consider that the applicant will not be the operator, ie the person who will have control over the operation of the disposal of radioactive waste; or if we consider the applicant will not operate in accordance with the permit (Paragraph 13, Schedule 5, EPR). We are satisfied that the applicant is the person who will have control over the operation of the facility after the grant of the permit as described in RGN1 "Understanding the meaning of operator".

4.9 We have assessed the applicant's competence and taken into consideration the applicant's record of compliance. We have not identified any reasons indicating that the applicant is unable to operate in accordance with the permit.

4.10 Securing compliance with an environmental permit is an important part of our regulation. We expect full compliance and we will use our enforcement powers including prosecution when necessary, to ensure that relevant action is taken by the operator. We have set out our Enforcement and Sanctions Statement and Guidance.

The Enforcement and Sanctions Statement and Guidance documents identify the principles we will apply in achieving firm but fair regulation. There are no recent enforcement matters in connection with Augean and their current operations at the ENRMF site.

Groundwater

4.11 The Groundwater (England and Wales) Regulations 2009 have now been repealed and replaced with Schedule 22 of the EPR. As a result we needed to confirm that the requirements of Schedule 22 are met in relation to radioactive waste disposal and all measures have been or are being taken to prevent the input of any hazardous substance (which now includes radioactive substances for the purpose of Schedule 22) into groundwater. Guidance on these requirements has been provided by Defra - Environmental Permitting Guidance. Groundwater Activities. December 2010. Version 1.0 (the Defra Guidance). The Defra Guidance states that preventing the input of hazardous substances into groundwater means taking all measures deemed necessary and reasonable to avoid their entry into groundwater. When considering what is environmentally significant and which measures are "necessary" in the case of radioactive substances, the Defra Guidance states that consideration should be given to the significance of any input in respect of the radiation doses, having regard to the radiological protection system of the International Commission on Radiological Protection and to the standards specified in Euratom Directives of the European Union (see further below). Also in the case of radioactive substances, when considering which measures are "reasonable", the Defra Guidance states that the radiation protection principle of optimisation should be observed. The Defra Guidance states that the main controls for radioactive substances are the requirement for an environmental permit under the EPR.

4.12 We have reviewed the relevant information on prior investigations undertaken at the site, site understanding (e.g. hydrogeology), potential impacts on groundwater and groundwater pathways (operational and post-closure phase), optimisation of groundwater releases and

monitoring provisions. We are satisfied that the proposals are consistent with the requirements of Schedule 22 of the EPR and the Defra Guidance, and that appropriate ongoing monitoring and review is in place.

Council Directive 96/26/Euratom (BSSD)

- 4.13** The BSSD lays down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation. It sets out the principles of justification, optimisation and limitation for practices involving radioactive substances.

Justification

- 4.14** The BSSD provides that all new classes or types of practice resulting in exposure to ionising radiation are to be justified before being adopted. A practice will be justified if it produces sufficient benefit to the exposed individuals, or to society, to offset the radiation detriment it causes. Decisions on justification will be taken by Government, and practices must not be permitted unless they are justified. The Justification of Practices Involving Ionising Radiation Regulations 2004 implement the BSSD requirements in respect of justification. Guidance on the application and administration of the Regulations published in May 2008 states 'that waste management and disposal operations are an integral part of the practice generating the waste and that it is wrong to regard them as a free-standing practice that requires its own justification.' There is therefore no separate requirement for justification in this case.

Optimisation

- 4.15** Article 6(3) of the BSSD defines the optimisation principle. This is implemented in England and Wales under Schedule 23, Part 3 of the EPR. The Environment Agency must exercise its functions in relation to radioactive waste to ensure that all exposures to ionising radiation of any member of the public and of the population as a whole resulting from the disposal of radioactive waste are kept as low as reasonably achievable (ALARA), taking into account economic and social factors, and the sum of the doses resulting from the exposure of any member of the public to ionising radiation must not exceed the specified dose limits. This requirement of the BSSD is now implemented under Schedule 23, Part 3 of the EPR.
- 4.16** An operator should use the "Best Available Techniques" (BAT) in relation to waste management and other associated matters which could have an impact on radiation doses to members of the public, in order to achieve the optimisation requirement. In conjunction with the Scottish Environment Protection Agency, and Northern Ireland Environment Agency we have published guidance entitled: Near-surface disposal facilities on land for solid radioactive wastes - Guidance on Requirements for Authorisation (GRA). The GRA explains the requirements we expect a developer or operator to fulfil when they apply for a permit to operate a near-surface facility. The GRA reiterates the requirement for optimisation which is described as: 'The choice of waste acceptance criteria, how the selected site is used and the design, construction, operation, closure and post-closure management of the disposal facility should ensure that radiological risks to members of the public, both during the period of authorisation and afterwards, are as low as reasonably achievable (ALARA), taking into account economic and societal factors' (GRA R8). The GRA also requires the disposal system to provide adequate protection against the non-radiological hazards of that waste (GRA R10).
- 4.17** In order to assess whether the proposed disposal of radioactive waste demonstrated BAT we reviewed the proposed techniques for disposal, the management arrangements and the validity of the dose assessments from the ENRMF against the requirements of the GRA. The ENRMF is an existing hazardous waste landfill which already satisfies and is managed according to the requirements of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (the Landfill Directive). We are satisfied that the techniques required by the Landfill

Directive and any additional measures described in the application satisfy the requirements of the GRA to protect the public and the environment against the radiological and non-radiological hazards of the radioactive waste, both at the time of disposal and in the future.

4.18 We conclude that the disposal of solid radioactive wastes up to 200Bq/g satisfies all limits, dose constraints and the risk guidance levels stipulated within the GRA and as such we are satisfied that the proposal represents the use of BAT to reduce doses to the public to as low as reasonably achievable (ALARA) taking into account economic and societal factors, and to protect the environment.

4.19 Our assessment of doses is a review of Augean's submission, taking into account the guidance entitled Principles for the Assessment of Prospective Public Doses <http://publications.environment-agency.gov.uk/pdf/PMHO1202BKLH-e-e.pdf> and assumptions of the behaviour and dietary patterns of representative members of the public.

4.20 **Consultation response:** *A respondent requested further explanation in relation to exposure pathways and details of the assumptions made on representative members of the public.*

Our response: *Augean has made an assessment of doses to a range of groups of the public, the most exposed of which will be considered to be the 'representative person'. These are described in the material submitted by Augean and include:-*

-Two groups exposed to leachate migrating from the landfill. One of the groups is assumed to be exposed to contaminated groundwater drunk from a well that is drilled into the aquifer 100m from the site. The assessment of the second group is based on exposure to water taken from a well 1500m from the site. There is a well at this location and the water is used for irrigation of foods but not for drinking. The representative person is drawn from these groups for some radionuclides and pessimistic doses derived are used to set limits.

-One group exposed to waste on the site from living in a house on the site after closure. The representative person is drawn from this group for some radionuclides.

-One group exposed to 10m³ of waste extracted from the site and spread on land at about 60 years after closure. The representative individual is drawn from this group for some radionuclides.

-One group exposed to contaminated leachate transported by lorry which is spilled in a crash.

-One group living near the site exposed from airborne debris caused by an aircraft crashing into the site.

-One group living near the site exposed to waste released from the site caused by a fire.

In addition we assessed the following groups of members of the public.

-One group living near Avonmouth and exposed to solid waste arising from sewage treatment of contaminated leachate. The solid wastes were applied to farmland and the group assumed to consume foods produced on it.

-One group of workers at the sewage plant at Avonmouth. These are considered to be members of the public in our assessment.

-One group living on the Severn Estuary and consuming fish and shellfish affected by waste water from a sewage works treating contaminated leachate.

-One group exposed to waste from the site from a substantial intrusion into the landfill in the early post closure stage - where 10,000m³ of waste is disturbed, mixed with soil and subsequently used on farmland. Food was then produced and consumed by the group. The representative person is drawn from this group for some radionuclides.

Augean also made assessments of groups of workers on the site.

Comparison of public doses with the GRA

- 4.21** Doses to the general public are consistent with the risk guidance levels and criteria specified in the GRA.
- 4.22** For the majority of scenarios during operational and post closure periods, the potential dose to a member of the public will be less than 20 microSv per year (0.02mSv/yr) which relates to the risk guidance level of 10^{-6} per year (i.e. the risk of developing fatal cancer from radioactive waste disposals at the ENRMF will be one in a million per year). The value of 10^{-6} per year is consistent with advice given in the HSE publication "Reducing Risks, Protecting People" (HSE 2001). The HSE publication identifies this value as "a very low level of risk" which should be used as a guideline for the boundary above which people are prepared to tolerate risks in order to secure the benefits from the activities giving rise to the risks and below which risks are broadly accepted by society because they are generally regarded as insignificant.
- 4.23** Following closure of the site, a number of scenarios, consistent with the GRA, could lead to doses greater than 0.02mSv/yr but less than 3mSv/yr. These scenarios are: using groundwater from a borehole drilled at the boundary of the site; and human intrusion into the waste and residing on the land, using the land to sustain the residents (i.e. crops and cattle).
- 4.24** In accordance with Schedule 23, Part 3, Section 1 of the EPR (which implements Article 7 of the BSSD) the Environment Agency must have regard to the following maximum doses to individuals which may result from a defined source, for use at the planning stage in radiation protection:
- 0.3 mSv per year from any source from which radioactive discharges are made (source related dose constraint); or
 - 0.5 mSv per year from the discharges from any single site (site related dose constraint).
- 4.25** For the operational and active institutional control phases, the Health Protection Agency (HPA) has recommended that a dose constraint of 0.15 mSv (annual dose) should apply to exposure to the public from a new disposal facility for radioactive waste.
- 4.26** We must therefore assess doses to the public from the expected discharges and compare the doses with the appropriate criteria. The current dose criteria we have used to assess against the application are extracted from section 6 of the GRA and are reiterated below. The criteria covers constraints to be applied during operational control and constraints post operational control, and include likely and unlikely scenarios for dose update.
- 4.27** GRA Requirement R5: Dose constraints during the period of authorisation. During the period of authorisation of a disposal facility for solid radioactive waste, the effective dose from the facility to a representative member of the critical group (most exposed member of the public) should not exceed a source-related dose constraint and a site related dose constraint.
- 4.28** GRA Requirement R6: Risk guidance level after the period of authorisation. After the period of authorisation, the assessed radiological risk from a disposal facility to a person representative of those at greatest risk should be consistent with a risk guidance level of 10^{-6} per year (i.e. 1 in a million per year).
- 4.29** GRA Requirement R7: Human intrusion after the period of authorisation. The developer/operator of a near-surface disposal facility should assess the potential consequences of human intrusion into the facility after the period of authorisation on the basis that it is likely to occur. The developer/operator should, however, consider and implement any practical measures that might reduce the chance of its happening. The assessed effective dose to any person during and after the assumed intrusion should not

exceed a dose guidance level in the range of around 3 mSv/year to around 20 mSv/year. Values towards the lower end of this range are applicable to assessed exposures continuing over a period of years (prolonged exposures), while values towards the upper end of the range are applicable to assessed exposures that are only short term (transitory exposures).

4.30 Augean carried out radiological assessments at the disposal limits that they were seeking, for the ENRMF, and we have reviewed these arrangements using current practice and the GRA. We decided to apply further precaution to the proposed concentrations of radioactivity in waste if mixed with soil after the period of authorisation when the site is closed and no longer managed. Augean had proposed a 1 to 10,000 dilution of waste to soil in the unlikely event that the waste was excavated for agricultural reasons post institutional control. We calculated doses using a 1 to 10 dilution since it would be reasonable to assume that mixing waste with anything less than 90% soil would be unusable for agricultural purposes. This led to an 18 fold reduction in limits requested by Augean. Assumptions regarding the quantity of material that might inadvertently be excavated at some point in the future; the area over which that material would be spread; the relative proportions of soil and waste in the material that is spread; the extent to which crops would be grown on it and resultant produce consumed are some of the factors that contribute to the derivation of radiological capacity and have been taken into account in our decision.

4.31 Radiological assessments of dose to the public from future disposals of LLW to the ENRMF take into account the behaviour of radionuclides in the landfill, potential ways out of the landfill, the time taken for radionuclides to emerge and radioactive decay. Radionuclide behaviour released from the landfill to the environment, in particular groundwater and leachate has been considered. The assessments also take into account future use of the site once it has been closed examining various future uses and potential intrusion scenarios. An assessment of exposure to radionuclides still present in the landfill after closure has been made. All assessments assume that disposal of each radionuclide occurs at 100% of the proposed disposal limits. We have tested the assessments using modelling systems and data to ensure that the assessments are consistent with the GRA and requirements of the BSSD.

4.32 Consultation response: *A respondent commented that the Environment Agency refers to local people accepting the level of health risks (a reference to sections 3.8 and 3.12 of the consultation comments at Annex 2 of the Explanatory Document). The respondent asked what evidence the Environment Agency has for this, as the respondent has the signatures of 3000 local people who say they are concerned.*

Our response: *In our response (see sections 3.8 and 3.12 of Annex 2 of the Explanatory Document) we explained risk in the context of radiological dose. The document HPA-RPD-055 - An Introduction to the Estimation of Risks Arising from Exposure to Low Doses of Ionising Radiation (June 2009) available from the HPA website at: <http://www.hpa.org.uk> was referenced. The HSE has also published a document 'The Tolerability of Risk from Nuclear Power Stations' which again attempts to explain risk and the level of risk which is tolerable to society as a whole. At no point did the Environment Agency refer to local people accepting the level of health risks, but attempted to explain risk in the general context of radiological dose from a scientific perspective.*

4.33 Consultation response: *Some respondents were concerned about dose and risk and in particular the Low Level Radiation Campaign (LLRC) questioned the basis of the radiological protection principles. They challenged the recommendations of the International Commission on Radiological Protection (ICRP) about dose and risk.*

Our response: *Radiological protection principles and legislation in the UK, the European Union and broadly the world are based on the recommendations of the ICRP. These recommendations are reviewed by the relevant UK competent national authority, namely the Radiation Protection Division of the Health Protection Agency (HPA-RPD), whose advice is taken into account in new or revised legislation, national policy, and Government guidance. We comply with the statutory requirements placed on us and make use of our statutory*

powers accordingly. We also keep in touch with developments in the field of radiological protection and take specialist advice directly from HPA-RPD, satisfying ourselves that HPA have properly considered the relevant evidence and are providing advice to us that is consistent with that evidence and meets our needs. On that basis we consider that the existing system of radiological protection as recommended by the ICRP continues to be the best available approach for protecting people from the harmful effects of ionising radiation.

4.34 Consultation response: A respondent was concerned that any radiation dose is unsafe, therefore how can the Environment Agency permit such disposals.

Our response: Please see our response above in connection with the consultation response from the Low Level Radiation Campaign. We issue permits to dispose of radioactive wastes to many varied organisations ranging from nuclear power stations to local hospitals and veterinary practices. The range of uses that radiation and radioactive materials have in our society is large and as a result radioactive wastes are generated. These wastes need to be safely and adequately disposed of. For all disposals of radioactive waste there will be some degree of exposure and impact to the environment and individuals. This is inevitable, and it is our role to ensure that disposals are safe and do not exceed the limits set out in legislation or Government guidance or policy. Holistically the disposal aspect is only part of the picture, since before the disposal option is chosen, the operator generating the waste has to ensure that waste is not unduly created, volumes are minimised and the waste hierarchy is applied prior to disposal options being finalised. This process too, at the consigning stage, is regulated by the Environment Agency.

Limitation

4.35 Schedule 23, Part 3, Section 1 of the EPR also implements the requirements of the BSSD in relation to limitation. In discharging its functions the Environment Agency must ensure that the sum of the doses resulting from the exposure of any member of the public to ionising radiation does not exceed the dose limits set out in Article 13 (subject to the exclusion set out in Article 6(4) which relates to exposures from medical treatment/research). Article 13 of the BSSD sets an effective dose limit of 1mSv/year from all man-made sources of radioactivity (other than medical exposure). The application of BAT contributes to satisfying the requirement that doses to the public are kept within dose limits. The Agency's assessment of dose to members of the public provides assurance that dose limits and constraints are met. The dose assessments are consistent with Articles 15, 16 (estimation of effective dose and equivalent dose) and 45 (estimates of population doses) of the BSSD. The use of permit conditions ensures that Article 47 (responsibilities of undertakings) of the BSSD is met.

Environment Act 1995 (EA 95)

4.36 The Environment Agency was brought into being through the provisions of EA 95, and it is through EA 95 that we are given powers to regulate radioactive substances, including powers to conduct inspections and take enforcement action. Certain key duties falling to the Environment Agency are identified below together with other relevant information.

Sustainable development

4.37 Section 4 of EA 95 sets out the principal aim of the Environment Agency: "(subject to and in accordance with the provisions of this Act or any other enactment and taking into account any likely costs) in discharging its functions so to protect or enhance the environment, taken as a whole, as to make the contribution towards the attaining the objective of achieving sustainable development" as described in ministerial guidance. A widely quoted definition of sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

4.38 In relation to England, the most recent Ministerial Guidance was issued to the Environment Agency in December 2002 - *The Environment Agency's Objectives and Contributions to*

Sustainable Development: Statutory Guidance, December 2002 (the Sustainable Development Guidance). The Sustainable Development Guidance links to the UK Sustainable Development Strategy (*A Better Quality of Life: A strategy for sustainable development in the UK* (May 1999), Cm 4345) although this strategy was subsequently updated (see below).

- 4.39 The Sustainable Development Guidance states that our main contribution to sustainable development will be to deliver our various objectives in a way that takes account (subject to and in accordance with EA 95 and any other enactment) of economic and social considerations. In respect of radioactive substances regulation, the Sustainable Development Guidance refers to the objective of regulating solid radioactive waste disposal in accordance with statutory duties, statutory guidance and Government policy.
- 4.40 The UK Sustainable Development Strategy was updated in 2005 with the publication by the Government of *The UK Government's Sustainable Development Strategy* (March 2005), Cm 6467. This states that: 'Our [UK] Strategy for sustainable development aims to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations' and introduces five guiding principles. In summary, these are:
- living within environmental limits;
 - ensuring a strong, healthy and just society;
 - achieving a sustainable economy;
 - using sound science responsibly;
 - promoting good governance;
- 4.41 We have considered the principal aim of the Environment Agency, set out in section 4 of EA 95 and the guidance issued by the Government in December 2002. We consider that the overall approach described in this document and the application of the BAT requirements contribute towards achieving sustainable development.

Statutory purpose of the Environment Agency's pollution control powers

- 4.42 Section 5 of EA 95 sets out the statutory purpose for which the Environment Agency's pollution control powers, including our powers under the EPR, must be exercised, namely: 'preventing or minimising, or remedying or mitigating the effects of, pollution of the environment'. We consider that we have properly exercised our pollution control powers contained in section 5 of EA 95, for the purpose of preventing or minimising, pollution of the environment, through the limits and conditions in the permit and through our consideration of BAT.

Economic and social well-being of local communities in rural areas

- 4.43 Under section 7(1)(c)(iii) of EA 95, the Environment Agency must have regard to the effect our proposals may have on the economic and social well-being of local communities in rural areas. Our assessment of the impact of discharges shows that the impacts are low. We have not identified any effects that would require us to include additional limits or conditions in the permit.
- 4.44 **Consultation response:** *A respondent requested additional information of how we have assessed the well being of the proposal on local communities.*
Our response: *Given that the ENRMF it is an existing hazardous waste landfill and traffic volume will remain the same, we are satisfied that there will be no impact on the economic and social well-being of the local community. The radiological impacts from this activity are minimal and as such we do not consider it appropriate to impose further limitations or conditions in the permit which would reduce impacts further.*

Duty to take into account likely costs and benefits

- 4.45** Section 39 of EA 95 places on the Environment Agency a general duty to take into account likely costs and benefits in considering whether and how to exercise our powers (unless and to the extent that it is unreasonable for it to do so). Section 56 specifies that costs include costs to any person and costs to the environment.
- 4.46** We have taken into account the likely costs and benefits of exercising our powers in accordance with section 39 of EA 95 and the Sustainable Development Guidance and are satisfied that the limits and conditions in the permit are appropriate.
- 4.47** ***Consultation response:** A respondent requested additional information of how we have assessed the likely costs and benefits of the proposal on local communities, especially the benefits.*
***Our response:** We explained in the Explanatory Document that we have taken into account the likely costs and benefits. We consider that the costs to the environment and any person are minimal as the impacts are low. We do not consider that there are any specific benefits to the local community, but there is a wider societal benefit in ensuring that radioactive waste is properly controlled and disposed of. Social and economic factors are taken into account when assessing BAT. We are satisfied that the conditions in the environmental permit are appropriate to protect the public and the environment.*

The Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations) and Habitats Assessment

- 4.48** The Habitats Regulations implement Council Directive 92/43/EEC on 'the conservation of natural habitats and of wild fauna and flora' (the Habitats Directive). The Habitats Directive aims to establish a network of the most important sites in respect of natural habitats and species of wild fauna and flora. It requires measures to be taken to maintain them at favourable conservation status or, where necessary, restore them by taking remedial action.
- 4.49** The Habitats Regulations require the Environment Agency to be satisfied that the integrity of designated 'European Sites' will not be adversely affected by relevant permissions issued by the Environment Agency. Sites may be designated as European Sites in respect of the habitats of bird species identified by the Birds Directive (Council Directive 79/409/EEC on 'the conservation of wild birds') (Special Protection Areas - SPAs), or in respect of habitats and species listed in Annexes I and II of the Habitats Directive (Special Areas of Conservation - SACs). The Habitats Regulations apply to 'candidate' as well as designated SACs.
- 4.50** Government policy (as set out in Planning Policy Statement (PPS) 9 on Biodiversity and Geological Conservation and Biodiversity Circular (Defra 01/05), Planning Policy Wales (2002), and the Ramsar Sites in England – A Policy Statement, DETR November 2000) is that potential SPAs and listed Ramsar sites (wetlands of international importance designated under the Ramsar Convention 1971) should be treated in the same way as European Sites.
- 4.51** There are two Natural Nature Reserves (NNR) both with Sites of Special Scientific Interest (SSSI) designations located near to the site. Closely bordering to the north and north-east of the site is the 151.5 hectare Collyweston Great Wood and Easton Hornstocks SSSI and approximately 2km to the east is the 30.8 hectare Bedford Purlieus SSSI. For the purposes of the Habitats Regulations the impacts to designated sites of discharges from the ENRMF have been assessed as being negligible.

- 4.52** We assessed this using our Habitats Stage 3 spreadsheets for terrestrial and marine environments. These spreadsheets use the methods and data published in Research & Development Report 128. We developed these methods jointly with English Nature (now

Natural England). We developed them mainly to meet our responsibilities under the Habitats Regulations. We can also use them to determine the effect that proposed discharges will have on designated areas and ecosystems in general. The spreadsheets calculate dose rates to a wide variety of species, which would be of conservation interest near the ENRMF. The assessments reported here only consider the discharges from this site.

Criteria for comparison with assessment

4.53 In its recent work, the Framework for Assessment of Environmental Impact (FASSET) project concluded that the threshold for statistically significant effects on organisms is about 100 micrograys per hour ($\mu\text{Gy/hr}$). Allowing for the dose rate from natural background, which is at most about 60 $\mu\text{Gy/h}$, we have adopted a value of 40 $\mu\text{Gy/h}$ as the level below which no further regulatory attention is needed.

4.54 *Consultation response:* A respondent was concerned that the Environment Agency had adopted as a threshold, a figure which will result in statistically significant effects on organisms, rather than one below this level and queried whether this was ALARA.

Our response: We do not use a threshold value for statistically significant effects in our wildlife dose assessments. The values we use are: 10 $\mu\text{Gy/h}$ as a screening value, and 40 $\mu\text{Gy/h}$ as an action level. The Augean risk assessment report compares the calculated dose rates to wildlife to the screening value of 10 $\mu\text{Gy/h}$. We have assessed the application by Augean to dispose of radioactive waste and the dose rates to wildlife have been calculated to be less than 10 $\mu\text{Gy/h}$.

The value of 10 $\mu\text{Gy/h}$ is used to screen out sites of low concern; if the dose rates to wildlife are calculated to be less than 10 $\mu\text{Gy/h}$ then we do not require further assessments to be made. The value was proposed by an international consortium of experts called PROTECT⁵. Data used to derive the value was taken from the FREDERICA⁶ radiation effects database. This included chronic exposure data for plants, invertebrates, birds, fish and mammals.

The action level of 40 $\mu\text{Gy/h}$ is used when we determine permits and was agreed with Natural England. This value was derived from the FASSET project⁷, and takes into account the dose received from background radiation. The results of the FASSET project showed that the threshold for statistically significant effects in most studies for most wildlife groups was 100 $\mu\text{Gy/h}$. To derive the action level, we subtracted a large value for background radiation (60 $\mu\text{Gy/h}$) from the 100 $\mu\text{Gy/h}$ threshold. This ensures that the total radiation from permitted releases and from natural background does not cause the dose rate to wildlife to exceed the threshold for statistically significant effects.

Data input to the assessment spreadsheets

4.55 The assessments of potential dose rates to plant and animal life were made at the proposed annual limits.

4.56 The predicted dose rates from the discharges from the ENRMF are less than 10 $\mu\text{Gy/h}$ and are well under the action level of 40 $\mu\text{Gy/hr}$, below which we consider that no further regulatory attention is needed.

4.57 *Consultation response:* A respondent requested further explanation about the term 'bird' with respect to radiological risk assessments associated with different bird species such as wren and red kite.

Our response: The term 'bird' refers to the bird reference organism. Given the variation between species, it is not generally possible to develop species-specific assessment

⁵ Information on PROTECT: <https://wiki.keh.ac.uk/display/permain/PROTECT>

⁶ Information on FREDERICA: <https://wiki.keh.ac.uk/display/rpermain/FREDERICA>

⁷ Information on FASSET: <https://wiki.keh.ac.uk/display/rpermain/FASSET>

systems (like for human radiation protection). Reference organisms are chosen to be representative of a range of species. We used the ERICA tool to calculate the dose rates to the reference bird from the activity concentrations in soil and water provided in the Augean risk assessment report. We also adjusted the size of the reference bird to represent small birds and large birds. For all reference birds, the dose rate was calculated to be less than 0.1µGy/h. This is two orders of magnitude lower than the 10µGy/h screening value, therefore we do not consider it necessary to complete further assessments.

- 4.58** The potential impact of the discharges of radioactive wastes into the environment from the ENRMF, together with other permits issued previously under RSA 93 and now EPR, which might impact on European Sites has been and is being dealt with by separate reviews we carry out under Regulations 63 and 64 of the Habitats Regulations.

Other conservation legislation

- 4.59** Other relevant legislative requirements relating to conservation are:

- under section 6(1)(b) of EA 95, the Environment Agency has a duty, to such extent as we consider it desirable, generally to promote the conservation of flora and fauna which are dependent on an aquatic environment;
- under section 7(1)(b) of EA 95, the Environment Agency has a duty to have regard to the desirability of conserving flora, fauna and geological or physiographical features of special interest;
- under section 7(1)(c)(ii) of EA 95, the Environment Agency has a duty to take account of the effect any proposal would have on the beauty or amenity of any rural or urban area or any flora, fauna, features or sites;
- the Environment Agency takes account of any notification and/or consultation responses received under section 8(3) of EA 95 (relating to sites of special interest).
- in discharging its duties under section 6(1), 7 or 8 of EA 95, the Environment Agency must have regard to any code of practice approved under section 9.
- under section 11A of the National Parks and Access to the Countryside Act 1949, the Environment Agency must have regard to the purposes of conserving and enhancing the natural beauty, wildlife and cultural heritage of specified areas and of promoting opportunities for the understanding and enjoyment of the special qualities of those areas by the public;
- under section 28G of the Wildlife and Countryside Act 1981, the Environment Agency must take reasonable steps, consistent with the proper exercise of its functions, to further the conservation and enhancement of the flora, fauna, or geological or physiographical features, by reason of which a site of special scientific interest (SSSI) is of special interest;
- under section 28I of the Wildlife and Countryside Act 1981, the Environment Agency is under a duty to consult Natural England before permitting any operation which is likely to damage any flora, fauna or geological or physiographical features by reason of which a SSSI is of special interest;
- under section 85 of the Countryside and Rights of Way Act 2000, the Environment Agency must have regard to the purpose of conserving and enhancing the natural beauty of relevant Areas of Outstanding Natural Beauty, when exercising its functions;
- under section 40 of the Natural Environment and Rural Communities Act 2006, the Environment Agency must have regard to the purpose of conserving biodiversity when deciding whether to grant an authorisation (and what conditions to impose). Biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

- 4.60** As a general point we consider that because the dose rate is below 40 µGy/hr there will be no effect on any of the flora and fauna in the environment. By definition there can be no effect on purely physical features, such as the geology, physiographical or the built environment.

- 4.61** We have considered the conservation objectives set out in section 6 and 7 of EA 95. Our view is that the limits and conditions of the environmental permit are sufficient to meet these objectives and that no other requirements are necessary.
- 4.62** We have considered our duties under the National Parks and Access to the Countryside Act 1949. The site is not likely to affect land in a National Park. We consider that the limits and conditions of the environmental permit are sufficient to meet our duties and that no other requirements are necessary.
- 4.63** We have considered our duties under section 28G of the Wildlife and Countryside Act 1981. These duties relate to Sites of Special Scientific Interest. Sites of Special Scientific Interest near the ENRMF are identified at paragraph 4.51. We consider that the limits and conditions of the permit are sufficient to meet our duties and that no other requirements are necessary.
- 4.64** We have considered our duties under section 28I of the Wildlife and Countryside Act 1981. We did not consult Natural England as we are satisfied that operations permitted are not likely to damage any of the flora, fauna or geological or physiographical features by reason of which any Sites of Special Scientific Interest are of special interest.
- 4.65** We have considered our duties under section 85 of the Countryside and Rights of Way Act 2000. The site is not situated in an Area of Outstanding Natural Beauty.
- 4.66** We have considered our duties under section 40 of the Natural Environment and Rural Communities Act 2006 and we are satisfied that the conditions of the permit are sufficient to meet our duties and that no other requirements are necessary.

Human Rights Act 1998 (HRA 98)

- 4.67** HRA 98 incorporates the provisions of the European Convention on Human Rights into domestic law. It requires public bodies, such as the Environment Agency, to act in a way which is compatible with the 'Convention Rights', being those Articles of the European Convention on Human Rights that are specified in HRA 98 (section 1, and Schedule1).
- 4.68** Convention rights that might be affected by our decision in relation to Augean's application are the right to life (Article 2), the right to a fair trial (Article 6), the right to respect for private and family life (Article 8) and the right to protection of property (Article 1, First Protocol).
- 4.69** Certain Convention rights are absolute. Some Convention rights are limited in explicit and finite circumstances. Other Convention rights are qualified. Interference with a qualified right may be justified if it is in accordance with the law, serves one of the aims set out in the qualification to the relevant Article and is 'necessary' in a democratic society. Interference may be considered 'necessary' if there is a pressing social need and any interference with individual rights is proportionate to the aim pursued. It is recognised that public authorities, such as the Environment Agency, often have to strike a balance between the general social and economic needs of the community and the specific interests of individuals.
- 4.70** We must consider whether our decision will result in, or fail to prevent, any potential or actual breach of a Convention right. If we identify such a breach, we must then consider whether we have the discretion under national law to act otherwise. A public authority will not be acting unlawfully under HRA 98, if it is required to act in a particular way by some provision of primary legislation. Where we do have discretion and the Convention right at issue is not absolute, we must then consider whether our decision is justified.
- 4.71** We consider that our regulatory process, including our consultation stages and the conditions in the permit are consistent with our duties under the HRA 98 and will not result in any actual or potential breach of a Convention right.

International Commitments

OSPAR Obligations

- 4.72** The UK is a contracting party to the *Convention for the Protection of the Marine Environment of the North East Atlantic* (the OSPAR Convention). The basic obligation of the OSPAR Convention, contained in Article 2(1), is that: 'The Contracting Parties shall, in accordance with the provisions of the Convention, take all possible steps to prevent and eliminate pollution and shall take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely affected.'

OSPAR Strategy for Radioactive Substances

- 4.73** The UK is a signatory to the strategy on radioactive discharges agreed at the OSPAR Ministerial meeting at Sintra, Portugal, in July 1998 - the 'OSPAR Strategy'. The objective of the OSPAR Strategy is: 'to prevent pollution of the maritime area from ionising radiation through progressive and substantial reductions of discharges, emissions and losses of radioactive substances, with the ultimate aim of concentrations in the environment near background values for naturally occurring radioactive substances and close to zero for artificial radioactive substances.'

UK Strategy for Radioactive Discharges

- 4.74** In July 2002 the Government issued its *UK Strategy for radioactive discharges 2001-2020* (Defra, July 2002) (the UK Strategy), the objective of which is to implement the UK's obligations in respect of the OSPAR Strategy.
- 4.75** We have considered the UK's OSPAR obligations and the UK Strategy. The UK Strategy applies to the waste and incinerator sector – including landfill. We have not set discharge limits for gaseous or aqueous releases of radioactivity. The limits of solid waste disposals have already taken into account predicted gaseous and liquid releases. Atmospheric and aqueous emissions will be periodically monitored for reassurance purposes. We consider that our regulatory approach, including consideration of BAT, contributes to the UK Strategy's aim of progressive and substantial reduction of radioactive discharges.

Treaty Establishing the European Atomic Energy Community (Euratom Treaty)

- 4.76** Under Article 37 of the Euratom Treaty a Member State must make a submission to the European Commission every time it alters the way it plans to dispose of radioactive waste. The Member State concerned must provide sufficient information and data to enable the Commission determine whether such a plan is liable to result in radioactive contamination of the water, soil or airspace of another Member State. The Commission provides its opinion within six months. We cannot grant an environmental permit to allow an operator to proceed with new plans for the disposal of radioactive waste until the Commission gives its opinion.
- 4.77** An Article 37 submission was made by Government in relation to Augean's application and the Opinion from the Commission was received on 11 January 2011. The Opinion states that: "the implementation of the plan for the disposal of radioactive waste in whatever form arising from the East Northants Low-level Radioactive Waste Disposal Facility in the United Kingdom, during its normal operational life and after its final closure, as well as in the event of an accident of the type and magnitude considered in the General Data, is not liable to result in the radioactive contamination of the water, soil or airspace of another Member State." A copy of the Opinion is attached at Annex 2.

Other applicable Explanatory Document consultation comments

4.78 Consultation response: *The proposal did not adhere to the proximity principle and should the Environment Agency not encourage landfill sites more local to sources of radioactive waste to apply for permits.*

Our response: *The Environment Agency cannot influence or encourage landfill operators to apply for permits to accumulate or dispose of radioactive wastes. If we are approached by an operator who is planning such an activity then we can provide advice on the processes to follow and explain our expectations. An operator must then apply to us and be in possession of a permit before such activities can take place. We are tasked to determine applications and issue a permit only if we are satisfied that the public and environment will be protected from such an activity. Consigning sites however should take into account the proximity principle when choosing where to send waste. Transportation distances are important considerations, however the choice of site has to take into account other factors on a case by case basis. The options chosen by consigning sites will be evident through optioneering assessments to ensure BAT is complied with.*

There are a relatively small number of specialist waste sites in the country, such as those permitted to take hazardous wastes or radioactive wastes, and therefore for some types of wastes a higher degree of transportation is required in order to secure higher environmental protection of the waste.

The UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry has recently been published by the NDA. Many LLW management options are described. However, as stated above, ultimately the consignors of waste, the NDA and market forces will influence who will make and when applications are received by the Environment Agency.

4.79 Consultation response: *This would be the first landfill site in the country to accept radioactive waste outside the control of nuclear industry.*

Our response: *This is not the case. Many landfill sites have and still do accept and dispose of radioactive wastes. Some consigning sites have a permit to dispose to landfill while the majority do not require a permit for low volume disposals. We regulate radioactive waste disposals from facilities such as hospitals, universities, veterinary practices and medical research establishments as well as from nuclear licensed sites.*

4.80 Consultation response: *One respondent raised concerns about what might happen if Augean ceased to exist as a company.*

Our response: *Financial provision has been provided by Augean in respect of its hazardous waste landfill operation, which would provide sufficient funds to ensure the environment remains protected if Augean ceased trading as a company. If Augean is bought by a third party, or the site is sold separately, the new operator would need to apply for the permit to be transferred and any new operator would similarly need to provide financial provision.*

4.81 Consultation response: *One respondent raised concerns over the lack of long term monitoring.*

Our response: *Monitoring requirements will remain in force as long as the permit is held by the operator. This could be many years after the closure of the site.*

4.82 Consultation response: *The disposal of radioactive wastes to the ENRMF does not represent Best Available Technique when compared to proposals of LLW disposals at Dounreay and L'Aube.*

Our response: *The design of Dounreay and the ENRMF differ since they apply to different types and activity wastes. BAT has to be considered on a case by case basis. The Dounreay LLW disposal facility is designed for the purpose of disposing of radioactive wastes up to 12,000 Bq/g and includes vaults for lower activity wastes. Dounreay Site Restoration Limited (DSRL) state that for the lower activity wastes associated with rubble whose activity is <40Bq/g then large nylon bags will be employed to contain the ungrouted waste within the*

designated lower activity engineered vaults. It is recognised by DSRL that groundwater will eventually enter the facility due to the low permeability of the concrete. It is our view that disposal of solid low level radioactive wastes up to a maximum of 200Bq/g to an engineered hazardous waste landfill that has satisfied the GRA, utilising management controls and techniques to ensure the waste is contained is in our view BAT; this is not inconsistent with the approach used for lower activity waste at Dounreay. At the ENRMF the radioactive waste will be mixed with other non-radiological wastes and leachate generated can be effectively managed offsite. The waste will be covered on a daily basis and doses have been assessed to be well within dose constraints and below 20microSv/yr for representative members of the public for scenarios likely to occur. Operators at Dounreay and L'Aube are choosing to cover the vaults during waste disposal operations to keep the waste dry and the ENRMF are not, however leachate management, its sampling, collection and offsite disposal are well established practices and we consider remain appropriate in this case.

4.83 Consultation response: Concerns expressed over the long term impacts to the environment and reliability of assessments

Our response: The radiological assessments used for differing scenarios are pessimistic and have inherent caution built into the calculations. For instance it is pessimistically assumed that the polyethylene components of the liner degrade within 60 years and its inherent low permeability characteristics are lost. This is coupled with the assumption that all the radionuclides contained within the original waste become mobile and are free to migrate. Clearly this assumption is useful for pessimistic assessment purposes but does not totally reflect real life characteristics of radioactive wastes in the environment.

4.84 Consultation response: The disposal of radioactive wastes should be a national issue for consideration.

Our response: The NDA have recently published (following consultation) the UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry. LLW waste disposal to landfill is one of several options described in this strategy and as such is recognised as a national issue for consideration.

4.85 Consultation response: Some respondents were concerned about the integrity of the clay barrier over the lifetime of the waste.

Our response: The application contains cautious modelling assumptions which have considered that the integrity of the HDPE liner is lost within 60 years and therefore proves ineffective as a means of providing containment. The assessment includes a pessimistic assumption that all the radionuclides become mobile and are free to migrate into the geological barrier and underlying geology. It has been assessed that even when the synthetic barriers to containment break down, the likely doses received by the public are very small, in the order of less than 20 microSv/yr for scenarios that are likely to happen e.g. drinking from the nearest groundwater abstraction at 1500m from the site (where there is a well which is used for irrigation but not for drinking).

The design of the disposal cells satisfy modern standards associated with hazardous waste disposal. The use of clay is accepted as being a particularly stable product when coupled with high density plastics to contain wastes and leachates. It is assumed however, for calculating doses, that the integrity of the synthetic barriers is lost over a relatively short period of time as stated above.

4.86 Consultation response: Concern was expressed about the safety of abstracted water and at what distance abstraction would be safe. It was stated that the figures should be more transparent in terms of how they were derived.

Our response: The modelling of radionuclide movement uses hydrogeological modelling calculations with inputs from pessimistic data such that all radionuclides are mobile, and the HDPE liner proves ineffective within 60 years allowing leachate carrying radionuclides out into the geosphere. We examined the applicants calculations and assured ourselves that:

- 1) *The potential doses to the public and the environment from the disposal of radioactive wastes at the ENRMF do not exceed legal limits.*
- 2) *We verified the data at the actual 1500m abstraction point and the unlikely to occur scenario where a well is drilled to create an abstraction point at 100m i.e. the perimeter fence. Drinking water from abstraction point used and licensed for irrigation purposes at 1500m would provide a dose of <20microSv/yr. Drinking water solely from a borehole constructed at the site boundary following closure of the site is considered 'an unlikely to occur event', but could result in doses up to 35microSv/yr based on maximum disposal limits being reached. These doses from likely and unlikely (low probability) scenarios satisfy the risk guidance level described in the GRA.*

The respondent also questioned at what distance abstraction would be safe. We have explained that at the existing abstraction point at 1500m, if the water is used for drinking purposes (rather than for irrigation as licensed) then the dose to an individual would be <20microSv/yr. For unlikely scenarios, such as drilling boreholes used for drinking water purposes any nearer than 1500m then we have assessed that the dose will not exceed 35microSv/yr which based on the low probability of this occurring, satisfies the risk guidance level described in the GRA. There are virtually no activities, either at work or in people's private lives, that are completely free of risk. When we authorise the discharge or disposal of polluting substances, including radioactive substances, so that an industrial activity may take place, we recognise that members of the public will be subject to a small risk as a result. For this reason, we set stringent limits on the discharge or disposal and, for radioactive substances, we also require that best available techniques should be used to reduce the discharges still further, so that the risk to members of the public is as low as reasonably achievable within the limits we have set.

The risks from different activities can be compared and we sometimes use such comparisons in the presentations we make. We recognise that the risks from different activities arise in different circumstances depending on the nature of the activity, and that some people may not regard a particular comparison between risks as valid because of this. However, we regard a comparison between risks of different types arising in different circumstances as better and more helpful than no comparison at all between risks.

We recognise that it is also possible to compare the potential consequences from different activities without having regard to the likelihood of those consequences. We consider, however, that such an approach is potentially misleading and does not generally lead to sound choices being made.

Risks from exposure to low doses of ionising radiation is covered by HPA advice in document HPA-RPD055.

4.87 Consultation response: *The Environment Agency are actively endorsing the application by Augean*

Our response: *We are not in a position to endorse any application but are tasked to provide advice to potential applicants on the process they must follow. When applications are submitted we are obliged to determine them in accordance with the relevant legislation, carrying out a technical assessment based on science. Where a permit is issued we will inspect operations to ensure the conditions in the permit are being adhered to.*

The Environment Agency is a non-departmental public body with vested legal duties, responsibilities and powers. The Environment Agency is independent of the industries that it regulates.

4.88 Consultation response: *For consigning sites – how transparent will their application to dispose to a particular landfill be?*

Our response: *Government have issued Radioactive Substances Regulation Guidance (March 2010) on this issue which at paragraph 4.31 states: 'These Regulations [meaning EPR] have removed the previous requirement under RSA 93 that applications for disposal are sent to the Local Authorities where it is proposed to send waste for disposal. As a result it will not be necessary for permits to identify specific site(s) at which the waste will ultimately be disposed of. Permits can allow transfer to any site where the operator of that site holds an*

environmental permit to accumulate or dispose of the relevant type of waste, or for LV-VLLW to any site disposing of conventional waste. However, the Environment Agency may identify specified sites in permits as necessary to meet the requirements of Government policy, for example to deliver the requirements of the proximity principle and the waste hierarchy. Records of waste transfers must be kept by both the consignor and the receiving site operator.' And at paragraph 4.33: 'To ensure the previous level of transparency under RSA 93 is maintained, the Environment Agency should ensure that new environmental permits for sites that undertake final disposal of radioactive waste contain a condition requiring the operator to inform their local authority before the operator first receives waste from any new consignor. This condition should be included in existing permits before an operator of such a disposal facility accepts radioactive waste from a new consignor. Operators should inform the local authority of the origin and nature of the radioactive waste before the first waste is received from a new consignor.' We have therefore included appropriate wording at conditions 1.4.13 and 1.4.14 of the permit.

4.89 Consultation response: Should the minimum depth of cover be 0.3m?

Our response: This is the minimum depth which would satisfy the requirement to contain emplaced waste prior to subsequent disposals being emplaced above. The waste is already contained in steel drums or double bagged. Ultimately, when the cell is full, a much deeper cap and cover of 1.5m will be placed over the waste. If Augean do not cover to this minimum demonstrable depth then, as would be in the case for breaches of any permit condition, we would follow our Enforcement and Sanctions Statement and Guidance..

4.90 Consultation response: The proposal fails to ensure the local community are adequately protected from the risks of the proposal.

Our response: We have examined Augean's proposal and issued a permit stipulating the conditions Augean must adhere to. We consider that the local community will be adequately protected by the permit conditions. The issue of risk and exposures to low levels of radiation is explained in the HPA document HPA-RPD055.

4.91 Consultation response: Waste should be independently monitored, not relying on the data supplied by the applicant.

Our response: Where there is a good reason to require it, we make holders of permits to dispose of radioactive waste monitor the environment around them and report the results publicly. As far as the permit is concerned we impose environmental monitoring conditions on the operator. At this point in time we see no reason to carry out further independent monitoring on or around the site but we may choose to do so in the future.

4.92 Consultation response: One respondent was concerned that the Environment Agency has not set leachate activity limits.

Our response: We set limits and regulate, as we have in this case, on what can be disposed of to the landfill and not what is released from the landfill following radioactive waste disposal. This is consistent with how we regulate incinerators for instance. Emissions of radioactivity into the environment as a result of disposals have been assessed and will be regularly monitored through the implementation of specified environmental monitoring arrangements which will be openly reported. If the activity in the leachate does not correspond to modelled figures, then Augean are required to ensure that disposal via Avonmouth remains appropriate or else they will need to implement other measures to ensure the public and environment remain adequately protected. These requirements are set out at Tables 3 and 6 of the permit.

4.93 Consultation response: Concern was raised over radiological dust generation and its impact.

Our response: Augean will collect dust and monitor it for radioactivity at various positions within the site that we agree and report this information to us periodically (see Table 3 of the permit). We expect to see the waste contained and remain covered. If activity is detected then Augean will be required to examine and report on the reasons for such results. Failure

of management arrangements designed to contain the waste, for instance, is a breach of the permit which could possibly lead to enforcement notices or even prosecution.

4.94 Consultation response: Concern was raised over local land contamination caused by radioactive dust and leachate.

Our response: Augean will have measures in place providing assurance that demonstrates containment of radioactivity as discussed in paragraphs 4.91 to 4.93. The spread of contamination from the failure to contain the waste will be dealt with strictly in accordance with our Enforcement and Sanctions Statement and Guidance.

4.95 Consultation response: There is a lack of security surrounding the site.

Our response: Permit condition 1.3.1 stipulates the requirement for adequate security measures. We will inspect security arrangements prior to the delivery of the first consignment of waste.

4.96 Consultation response: Concern that the site is too close to nature reserves.

Our response: We have assessed the application and the proximity of the nature reserves. We believe that any radiological impact from this proposal is well within guidance levels and would not detract from the benefits such nature reserves provide to a wildlife species, habitat and amenity for the local population. Please refer to paragraphs 4.48 to 4.66 for additional information.

4.97 Consultation response: Various responses were received to amend the wording in the draft permit. These are listed below with our response.

No.	Comment on permit	Our response
1	There is no mention in the introductory note about a programme of sampling and monitoring.	We have no need to mention in the introductory note and it serves no legal purpose.
2	Storage is mentioned in the Introductory Note at In3. Despite storage times of 8 hrs prior to disposal and 5 days in the event of non compliant waste, there are no accumulation conditions in place. A storage requirement is that any relevant containers are legally marked with the words "radioactive" and the radiation symbol.	We are not permitting accumulation and consider the conditions in the permit are adequate for non-compliant waste that needs to be returned.
3	Why no mention of site closure arrangements – should a requirement be stipulated in the permit	The process to surrender the permit will adequately consider closure arrangements.
4	Also in 3.2.3, it states that radioactive waste will be disposed of in enclosed double bags OR enclosed steel drums. In the authorisation a condition of disposal is that the radioactive waste will be disposed in enclosed double bags AND enclosed steel containers. Are these steel containers assisting in the transporting of waste to the site or are they a further barrier to reduce radionuclide migration?	We note the typographical error contained in the draft permit of the explanatory document. The draft permit should state ..'enclosed double bags or enclosed steel containers'.. The permit has been amended to correct for this error. The container type is to assist transportation and to prevent escape of waste during emplacement within the site.
5	The general management at 1.1.1 should have in addition to a management system, an organisation structure and resources, sufficient	We consider there to be sufficient prescribed conditions. A management system should

	<i>to achieve compliance with the authorisation limits and conditions.</i>	<i>include organisational structure and resources.</i>
6	<i>There is no mention of posting the names of the suitably qualified and experienced persons considered competent to carry out supervision of the waste disposal process, as required by section 19 of the Act.</i>	<i>There is no requirement to post individual's names in RSA 93 or the EPR. However the permit has been amended as a result of changes in the legislation to include a condition to display the permit (see condition 1.1.8).</i>
7	<i>There is no mention of the operator needing to provide operating procedures to assist in complying with the limits and conditions of the authorisation.</i>	<i>Operating procedures are part of an adequate management system.</i>
8	<i>There is no mention of the need to inform the Agency of a change in name at least 28 days in advance of it happening.</i>	<i>This requirement is stated at permit condition 1.10.3(b)</i>
9	<i>In 1.4.1(e) how will this condition be examined by the landfill site operator, unless it specifically referred to in the consignment note?</i>	<i>An adequate management system would require this requirement to be reiterated within contracts and conditions for acceptance and periodically verified through internal audit. Consigning sites are also inspected to ensure disposals occur compliantly.</i>
10	<i>In 1.4.2(a) the sentence should read "the radioactive waste consignments without unloading it -----"</i>	<i>We have amended the condition to improve clarity.</i>

5 Our Decision

- 5.1** We have considered Augean's application for a permit to dispose of solid LLW up to a maximum activity of 200Bq/g including HV-VLLW at their ENRMF site. We have taken account of all relevant legal and policy considerations as set out in section 4. Our considerations and assessment did not identify any objection in principle to the proposal but we have applied additional precaution to the concentration of radioactivity in radioactive waste if mixed with soil when the site is no longer managed. Augean carried out radiological assessments at the disposal limits that they were seeking for the ENRMF, and we have reviewed these arrangements using current practice and referenced against criteria specified in the GRA. We decided to apply further precaution to the proposed concentrations of radioactivity in waste if mixed with soil after the period of authorisation when the site is closed and no longer managed. Augean had proposed a 1 to 10,000 dilution of radioactive waste to soil in the unlikely event that the waste was excavated for agricultural reasons post institutional control. We reassessed doses using a 1 to 10 dilution of waste to soil since it would be reasonable to assume that mixing waste with anything less than 90% soil would be unusable for agricultural purposes. This lead directly to an 18 fold reduction in limits requested by Augean.
- 5.2** Our assessment of doses has been a review of the Augean's submission against appropriate science and taking into account guidance on assumptions of the behaviour and dietary patterns of representative members of the public. Doses for the activity of disposing of radioactive waste at the ENRMF satisfy the dose criteria and risk guidance levels specified in the GRA. For likely scenarios the dose to the general public will be below the risk guidance level of 10^{-6} indicating that there would be a one in one million chance of a member of the public developing cancer from radioactive waste disposal operations at the ENRMF.
- 5.3** Augean's application to dispose of solid radioactive wastes up to 200 Bq/g to an existing hazardous waste landfill satisfies the principles of the GRA and we are satisfied that the proposal represents the use of BAT to ensure that doses to the public and environment will be as low as reasonably achievable (ALARA) taking into account economic and societal factors.
- 5.4** We confirm that we are issuing a permit to Augean following their application as shown in Annex 3. We will issue the permit on the 25th May 2011. We will inform all parties engaged during the consultations and publish this decision document on our website.
- 5.5** The table below lists the maximum limits for each radionuclide or group of radionuclides which we would authorise at a maximum activity concentration of 200Bq/g in total.

Radionuclide or group of Radionuclides	Limit GBq
H-3	3230
C-14	170
Cl-36	85
Fe-55	595
Co-60	732
Ni-63	187
Sr-90	1750
Nb-94	85
Tc-99	374
Ru-106	391
Ag-108m	85
Sb-125	85
Sn-126	85
I-129	85
Ba-133	85
Cs-134	85
Cs-137	5100
Pm-147	119
Eu-152	85
Eu-154	85
Eu-155	85
Pb-210	85
Ra-226	306
Ac-227	85
Th-229	85
Th-230	85
Th-232	85
Pa-231	85
U-232	85
U-233	85
U-234	85
U-235	85
U-236	85
U-238	85
Np-237	85
Pu-238	102
Pu-239	170
Pu-240	85
Pu-241	1190
Pu-242	85
Am-241	119
Cm-243	85
Cm-244	85
Any other radionuclide	85
TOTAL	17000

Note: 1 GBq = 1x10⁹ Bq

Annex 1 – Places where documents can be viewed, including relevant public registers and list of consultees

Public Registers where Consultation Documents, Application and Further Information Responses can be found.
Northamptonshire County Council
Environment Agency Office – Peterborough
Environment Agency Office – Wallingford
Organisations Consulted and Comments invited
Health and Safety Executive
Food Standards Agency
Northamptonshire County Council
East Northants District Council
Wastewatchers
Kings Cliffe Parish Council



EUROPEAN COMMISSION

Brussels, 11.1.2011
SG-Greffe(2011) D/ 457

Subject: Commission opinion of 10.1.2011 relating to the plan for the disposal of radioactive waste arising from the East Northants Low-level Radioactive Waste Disposal Facility, located in Northamptonshire, United Kingdom, in accordance with Article 37 of the Euratom Treaty

Sir,

On 3 June 2010, the European Commission received from the British Government, in accordance with Article 37 of the Euratom Treaty, General Data relating to the plan for the disposal of radioactive waste arising from the East Northants low-level radioactive waste disposal facility.

On the basis of these data, and following consultation with the Group of Experts, whose report is annexed to this letter, the Commission has drawn up an opinion which you will find here attached.

I remain, Sir,
Yours faithfully,

For the Secretary-General

A handwritten signature in black ink, appearing to read 'Karl Von Kempis'.

Karl VON KEMPIS

Encls.: Doc. C(2010) 9696 final
Doc. No. No 6291/10 EN

The Right Hon. William HAGUE
Secretary of State for Foreign and
Commonwealth Affairs
Downing Street
UK – LONDON SW1 2AL



EUROPEAN COMMISSION

Brussels, 10.1.2011
C(2010) 9696 final

COMMISSION OPINION

of 10.1.2011

**relating to the plan for the disposal of radioactive waste arising from the East Northants
Low-level Radioactive Waste Disposal Facility, located in Northamptonshire, United
Kingdom, in accordance with Article 37 of the Euratom Treaty**

(only the English text is authentic)

EN

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COMMISSION OPINION

of 10.1.2011

relating to the plan for the disposal of radioactive waste arising from the East Northants Low-level Radioactive Waste Disposal Facility, located in Northamptonshire, United Kingdom, in accordance with Article 37 of the Euratom Treaty

(only the English text is authentic)

On 3 June 2010, the European Commission received from the British Government, in accordance with Article 37 of the Euratom Treaty, General Data relating to the plan for the disposal of radioactive waste arising from the East Northants Low-level Radioactive Waste Disposal Facility.

On the basis of these data and additional information requested by the Commission on 5 July 2010 and provided by the British authorities on 2 August 2010, and following consultation with the Group of Experts, the Commission has drawn up the following opinion:

1. The distances between the disposal facility and the nearest point on the territory of other Member States, in this case France and Belgium are 220 km and 269 km respectively.
2. During the disposal facility's operational period:
 - Radioactive waste will be stored in the disposal facility without intention of retrieval.
 - The disposal facility will not be subject to a discharge authorisation for liquid and gaseous radioactive effluents. However, radioactive gases will emanate from the disposal facility; these are not liable to affect the health of the population of another Member State.
 - In the event of unplanned releases of radioactive effluents, which may follow an accident of the type and magnitude considered in the General Data, the doses received in another Member State will not be liable to affect the health of the population.
3. After the disposal facility's operational period:

The measures envisaged for the final closure of the disposal facility as described in the General Data, provide reliance that the conclusions under point 2 above will remain valid in the long term.

EN

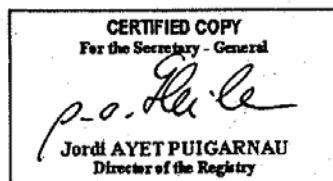
2

EN

In conclusion, the Commission is of the opinion that the implementation of the plan for the disposal of radioactive waste in whatever form arising from the East Northants Low-level Radioactive Waste Disposal Facility in the United Kingdom, during its normal operational life and after its final closure, as well as in the event of an accident of the type and magnitude considered in the General Data, is not liable to result in the radioactive contamination of the water, soil or airspace of another Member State.

Done at Brussels, 10.1.2011

*For the Commission
Günther OETTINGER
Member of the Commission*



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ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2010

**PERMIT
AND
INTRODUCTORY NOTE

RECEIPT AND DISPOSAL
OF RADIOACTIVE WASTE AT A LANDFILL SITE**

**Augean South Ltd
East Northants Resource Management Facility
Stamford Road
Kings Cliffe
Northamptonshire
PE8 6XX**

**PERMIT NUMBER
CD8503**

INTRODUCTORY NOTE

- IN 1.** This Note does not form part of the environmental permit.
- IN 2.** The following contains details of the environmental permit issued by the Environment Agency under the provisions of regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010 now referred to as EPR. The permit authorises the disposal of the specified radioactive waste.
- The environmental permit includes a signed page together with schedule 1. The signed page includes the date from which the permit shall take effect. Schedule 1 contains general conditions and limitations relating to all radioactive waste streams.
- IN 3.** EPR is concerned with the control of radioactive material and any subsequent storage and disposal of radioactive waste. The conditions attached to the environmental permit are concerned with the receipt and disposal of radioactive waste.
- IN 4.** The environmental permit does not permit contravention of any other enactment or any order made, granted or issued under any enactment; nor does it permit any contravention of any rule of law. In particular any requirements governing radioactive substances under the Health & Safety at Work etc Act 1974 will additionally need to be observed.



ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2010

Receipt and Disposal of Radioactive Waste

Augean South Limited

CD8503

The Environment Agency hereby authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

Augean South Limited

(Company Registered No 4636789)

("the operator")

whose Registered Office is

4 Rudgate Court, Walton, Wetherby, LS23 7BF

to carry on radioactive substances activities described in Schedule 23 Part 2 paragraph 5(4)(a) and Schedule 23 Part 2 paragraph 5(2)(b) of the Environmental Permitting (England and Wales) Regulations 2010, being receipt and disposal of low level waste, on the premises used by the operator at

**East Northants Resource Management Facility, Stamford Road,
Kings Cliffe, Northamptonshire PE8 6XX**

subject to the limitations and conditions in the Schedule to this environmental permit.

This permit shall come into effect on **<date>** .

Signed

<Name of authorised person>

Authorised to sign on behalf of the Environment Agency

Dated the

Schedule 1

STANDARD CONDITIONS AND LIMITATIONS

GENERAL MANAGEMENT

- 1.1.1 Subject to conditions 1.1.4, 1.1.6 and 1.1.7 the disposal of radioactive waste shall be managed and operated:
- (a) in accordance with a management system, which identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents and non-conformances and those drawn to the attention of the operator as a result of complaints; and
 - (b) by sufficient persons who are competent in respect of the responsibilities to be undertaken by them in connection with the disposal of radioactive waste.
- 1.1.2 Records demonstrating compliance with conditions 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.
- 1.1.4 The operator shall make provision for consultation with such suitable RPAs, or other such qualified experts as the Agency may approve in writing, as are necessary for the purpose of advising the operator as to compliance with the limitations and conditions of this permit.
- 1.1.5 The operator shall use the best available techniques to dispose of radioactive waste at times, in a form, and in a manner so as to minimise the radiological effects on the environment and members of the public.
- 1.1.6 The operator shall maintain in good repair the systems and equipment provided for the disposal of radioactive waste.
- 1.1.7 The operator shall check, at an appropriate frequency, the effectiveness of systems, equipment and procedures provided for the disposal of radioactive waste.
- 1.1.8 The operator shall post copies of this permit on the premises, in such characters and in such positions to be conveniently read by persons who have duties on the premises which are or could be affected by the matters set out in this permit.

ACCIDENTS THAT MAY CAUSE POLLUTION

- 1.2.1 The operator shall:
- (a) maintain and implement an accident management plan;
 - (b) review and record at least every 2 years or as soon as is reasonably practicable after an accident, (whichever is the earlier) whether changes to the plan should be made;
 - (c) make any appropriate changes to the plan identified by a review.

SITE SECURITY

- 1.3.1 Site security measures shall prevent unauthorised access to the radioactive waste, as far as is reasonably practicable.

WASTE ACCEPTANCE AND DISPOSAL

- 1.4.1 Radioactive waste shall only be accepted for disposal if:
- (a) it is solid radioactive waste not exceeding 200Bq/g;
 - (b) it:
 - (i.) would be acceptable for disposal under environmental permit EPR/TP3430GW as if that permit applied to the waste and all the relevant waste acceptance procedures have been completed and it fulfils the relevant waste acceptance criteria, including any derogations specified in that environmental permit; or

- (ii.) would be inert waste, if it were not radioactive waste and all the relevant waste acceptance procedures have been completed and it fulfils the relevant waste acceptance criteria; or
 - (iii.) would be non-hazardous waste, if it were not radioactive waste and all the relevant waste acceptance procedures have been completed and it fulfils the relevant waste acceptance criteria.
- (c) it has not been diluted or mixed solely to meet condition 1.4.1(a) and (b).

- 1.4.2 The operator shall visually inspect the radioactive waste consignment:
(a) without unloading it, on arrival at the landfill; and
(b) at the point of deposit;
and shall satisfy himself as far as reasonably practicable that it conforms to the consignor's characterisation documentation provided for that radioactive waste.
- 1.4.3 Radioactive waste found not to meet the requirements of condition 1.4.1 shall be returned to the consignor as soon as is reasonably practicable and within 24 hours of the quarantine facility becoming full, and in any event within 5 days of receipt at the site.
- 1.4.4 The operator shall use the best available techniques when taking samples and conducting measurements, tests, surveys, analyses and calculations, to determine compliance with the limitations and conditions of this permit, unless particular means are specified in writing by the Agency.
- 1.4.5 Where the operator has taken samples to establish that the radioactive waste is in conformity with the documentation submitted, then the samples taken shall be retained for at least one month and results of any analysis for at least two years.
- 1.4.6 The activity of radioactive waste disposed of shall not exceed the limits specified in Table 1.
- 1.4.7 The operator shall dispose of radioactive waste as specified in Table 2.
- 1.4.8 The operator shall provide a receipt to the person delivering radioactive waste. The receipt shall include the details specified in record numbers 2 to 8 of Table 4.
- 1.4.9 The operator shall not accept delivery of radioactive waste while landfill disposal activities under the current environmental permit EPR/TP3430GW have ceased.
- 1.4.10 The operator shall so far as is reasonably practicable prevent the loss or escape of any radioactive waste.
- 1.4.11 If the operator believes or has reasonable grounds for believing that any radioactive waste has been lost or stolen he shall:
(a) without delay inform the Police and the Agency;
(b) so far as is reasonably practicable recover the radioactive waste; and
(c) as soon as is reasonably practicable notify the Agency in writing of the circumstances of the occurrence and the means taken to recover the radioactive waste.
- 1.4.12 If the operator believes or has reasonable grounds for believing that any radioactive waste is escaping or has escaped from any container or location in which it is stored he shall:
(a) without delay inform the Agency;
(b) so far as is reasonably practicable:
(i) prevent any further escape; and
(ii) minimise the spread of any contamination; and
(c) as soon as is reasonably practicable report the circumstances in writing to the Agency.
- 1.4.13 Before the operator first receives radioactive waste from a consignor for the purpose of final disposal of that waste from or on the premises, the operator shall, at the earliest opportunity, inform the local authority, in whose area of responsibility the premises is situated, of the origin and nature of the radioactive waste.

1.4.14 The provisions of condition 1.4.13 do not apply:

- (a) where the waste consignor is exempt from the requirement to hold an environmental permit for the disposal of radioactive waste;
- (b) to the extent that it would require the disclosure of information relating to sealed radioactive sources;
- (b) to VLLW.

IMPROVEMENT PROGRAMME

1.5.1 The operator shall complete the improvements specified in Table 6 by the date specified in that table unless otherwise agreed in writing by the Agency.

1.5.2 Except in the case of an improvement which consists only of a submission to the Agency, the operator shall notify the Agency within 14 days of completion of each improvement.

CLOSURE AND DECOMMISSIONING

1.6.1 The operator shall dispose of radioactive waste so as to prevent or where that is not practicable, to minimise, any pollution risk on closure and decommissioning.

MONITORING

1.7.1 The operator shall, unless otherwise agreed in writing by the Agency, undertake the sampling and monitoring specified in Table 3.

RECORDS

1.8.1 The operator shall maintain and implement a system which ensures that a record is made of the details specified in Table 4. Any information regarded by the operator as commercially confidential shall be clearly identified in the record.

1.8.2 All records required to be made by this permit shall:

- (a) be legible;
- (b) be made as soon as reasonably practicable;
- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- (d) be retained, unless otherwise agreed in writing by the Agency, for at least 2 years from the date when the records were made, or as specified in Table 5.

1.8.3 Records of acceptance and disposal of radioactive waste required to be made by this permit shall be made on the day of acceptance and disposal.

1.8.4 Any records required to be made by this permit shall be supplied to the Agency within 14 days where the records have been requested in writing by the Agency.

1.8.5 All records required to be made by this permit shall be held on site and shall be available for inspection by the Agency at any reasonable time.

REPORTING

1.9.1 Within 28 days of the end of the relevant reporting period or by the date specified in Table 7 the operator shall, unless otherwise agreed in writing by the Agency, submit reports of the details specified in that Table.

1.9.2 All reports and notifications required by this permit shall be sent to the Agency using the contact details supplied in writing by the Agency.

NOTIFICATIONS

- 1.10.1 The operator shall notify the Agency without delay following the detection of:
- (a) any malfunction, breakdown or failure of equipment or techniques, accident, or release of radioactive waste which has caused, is causing or may cause significant pollution from radioactive waste;
 - (b) the breach of a limit specified in this permit; or
 - (c) any significant adverse environmental effects.
- 1.10.2 If the operator believes or has reasonable grounds for believing that the acceptance or disposal of radioactive waste is occurring, has occurred or might occur which does not comply with the limitations and conditions of this permit he shall:
- (a) without delay inform the Agency;
 - (b) so far as is reasonably practicable prevent the further acceptance or disposal of radioactive waste; and
 - (c) as soon as is reasonably practicable report the circumstances in writing to the Agency.
- 1.10.3 Prior written notification shall be given to the Agency of the following events and in the specified timescales:
- (a) as soon as is reasonably practicable prior to the permanent cessation of disposal of radioactive waste; and
 - (b) at least 28 days prior to a change of name of the operator; and
 - (c) as soon as is reasonably practicable after the date of the first disposal of radioactive waste under this permit.
- 1.10.4 Where the Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Agency when the relevant monitoring is to take place. The operator shall provide this information to the Agency at least 14 days before the date the monitoring is to be undertaken.

INTERPRETATION

- 1.11.1 In this permit -

“activity” expressed in becquerels, means the number of spontaneous nuclear transformations occurring in a period of one second in a radioactive substance;

“Bq, kBq, MBq, GBq, TBq and PBq” are used as abbreviations meaning becquerels, kilobecquerels, megabecquerels, gigabecquerels, terabecquerels and petabecquerels respectively;

“inert” means radioactive waste which would be within the scope of Council Directive 1999/31/EC on the landfill of waste if the directive covered radioactive waste.

“low level waste” means solid radioactive waste, including any immediate packaging, with a maximum concentration of 4 gigabecquerels per tonne of alpha emitting radionuclides and 12 gigabecquerels per tonne of all other radionuclides.

“non-hazardous” means radioactive waste which is not covered within the scope of the Hazardous Waste (England and Wales) Regulations 2005 if those regulations covered radioactive wastes;

“relevant waste acceptance criteria” are derived from The Landfill Directive 1999/321/EC and Council Decision 2003/33/EC which establish waste acceptance criteria for landfills;

“relevant waste acceptance procedures” are derived from The Landfill Directive 1999/321/EC and Council Decision 2003/33/EC which establish waste acceptance procedures for landfills;

“RPA” means a Radiation Protection Adviser appointed under Regulation 13 of the Ionising Radiations Regulations 1999;

“sealed radioactive source” means a source whose structure is such as to prevent, under normal conditions of use, any dispersion of radioactive material into the environment;

“techniques” include both the technology used and the way in which the installation is designed, built, maintained, operated and dismantled.

“the Agency” means the Environment Agency.

“VLLW” is very low level waste and is a sub category of low level waste as defined in the “Policy for the long-term management of solid low-level radioactive waste in the United Kingdom. DEFRA, DTI and the Devolved Administrations. March 2007

1.11.2 “*best available techniques*” means the latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste. In determining whether a set of processes, facilities and methods of operation constitute the best available techniques in general or individual cases, special consideration shall be given to:

- (a) comparable processes, facilities or methods of operation which have recently been successfully tried out;
- (b) technological advances and changes in scientific knowledge and understanding;
- (c) the economic feasibility of such techniques;
- (d) time limits for installation in both new and existing plants; and
- (e) the nature and volume of the discharges and emissions concerned.

DISPOSAL OF RADIOACTIVE WASTE

Table 1

Radionuclide or group of Radionuclides	Limit GBq
H-3	3230
C-14	170
Cl-36	85
Fe-55	595
Co-60	732
Ni-63	187
Sr-90	1750
Nb-94	85
Tc-99	374
Ru-106	391
Ag-108m	85
Sb-125	85
Sn-126	85
I-129	85
Ba-133	85
Cs-134	85
Cs-137	5100
Pm-147	119
Eu-152	85
Eu-154	85
Eu-155	85
Pb-210	85
Ra-226	306
Ac-227	85
Th-229	85
Th-230	85
Th-232	85
Pa-231	85
U-232	85
U-233	85
U-234	85
U-235	85
U-236	85
U-238	85
Np-237	85
Pu-238	102
Pu-239	170
Pu-240	85
Pu-241	1190
Pu-242	85
Am-241	119
Cm-243	85
Cm-244	85
Any other radionuclide	85
TOTAL	17000

Table 2

Minimum depth of coverage by non-radioactive material or waste	0.3 metre
Maximum delay before disposal of radioactive waste	8 hours
Maximum delay before coverage after disposal	8 hours or by the end of that working day, whichever is the sooner
Container types	Enclosed double bagged or enclosed steel drums or a type agreed in writing by the Agency.

MONITORING

Table 3

Sample Type	Location	Frequency	Analysis
Groundwater	Boreholes K02a, K03, K04, K05, K06, K07, K08, K09, K14	Bi-annual	Gamma spec, total alpha and beta, tritium
Surface water	Surface water collected points KCSWNWPD, KCSWMP1, KCSWLAG and wheel wash run off.	Bi-annual	Gamma spec, total alpha and beta, tritium
Landfill gas	Environmental raw gas input point KCFLAINL	Bi-annual	Radon
		Bi-annual	Tritium
Dust	Downwind air sampler point KCDD01, Upwind air sampler KCDD02	Quarterly	Gamma spec, total alpha and beta.
Surface Soils	Surface soil locations as boundary to site KCSOIL01, KCSOIL02, KCSOIL03, KCSOIL04	Annual	Gamma spec, total alpha and beta.
Leachate	All leachate sumps and monitoring points in each phase used for LLW disposal'	Annual bulked per cell	Gamma spec, total alpha and beta, tritium
	Leachate transferred offsite for disposal	Quarterly bulked per transfer	Gamma spec, total alpha and beta, tritium
Site perimeter dose rate	5 perimeter locations adjacent to monitoring points K03, KCSOIL01, KCSOIL02, KCSOIL03, K13	Quarterly	Gamma dose rate at 1m above ground level using continuous measurement thermoluminescent dosimeter (measurement of TLD by an approved dosimetry service) or other technique as otherwise agreed by the Agency.

RECORDS

Table 4

Record Number	Record	Frequency of making record, unless agreed in writing with the Agency
1	A report stating the current environmental safety case for disposal of radioactive waste and how the operator has met the requirements of this permit	Each year
2	Date of delivery	Each consignment
3	Quantity of radioactive waste (m ³ and tonnes)	Each consignment
4	Identity of the waste producer	Each consignment
5	Site of origin of the waste	Each consignment
6	General description of the physical and chemical form of the radioactive waste	Each consignment
7	Activity of each radionuclide or group of radionuclides listed in Table 1	Each consignment
8	Specific activity by mass of each radionuclide or group of radionuclides listed in Table 1	Each consignment
9	The cell and grid reference used for disposal of radioactive waste	Each consignment
10	Total activity of each radionuclide or group of radionuclides	Each consignment

	listed in Table 1 disposed of under this permit: (a) for the whole site (b) for each disposal cell	
11	Total activity of each radionuclide or group of radionuclides listed in Table 1 disposed of under this permit: (a) for the whole site (b) for each disposal cell	Each year
12	Total specific activity by mass of each radionuclide or group of radionuclides listed in Table 1 disposed of under this permit: (a) for the whole site (b) for each disposal cell	Each year
13	Quantity of radioactive waste disposed of under this permit (m ³ and tonnes): (a) this calendar year (b) since the permit came into effect	Each year
14	Results from sampling and monitoring specified in Table 3	As completed
15	Radionuclide content of each waste stream received	As received
16	Tests, measurements, surveys or audits undertaken to demonstrate compliance with this permit.	As completed
17	Assessments or evaluations based on samples, measurements, tests and surveys	As completed

Table 5

Record Number identified in Table 4	Length of time for retention of record
1 to 7, 9, 11 to 17	Until surrender of the permit for the site

IMPROVEMENTS

Table 6

Improvement	Date
The operator shall provide the Agency with a report of a comprehensive review of the activities undertaken to demonstrate compliance with the limits and conditions specified within this permit for the disposal of radioactivity (e.g. checks, monitoring, sampling and audits). A programme for carrying out any necessary changes identified by the review should be included.	Every 3 years from the effective date of this permit or as otherwise agreed in writing by the Agency.
The operator shall provide the Agency with an updated Environmental Safety Case for the site.	Every 5 years from the effective date of this permit or as otherwise agreed in writing by the Agency.
The operator shall provide the Agency with a report of a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the assessment of the impact of the emissions submitted with the application. A programme for carrying out any necessary changes identified by the review should be included.	Every year from the date of first radioactive waste disposal or as otherwise agreed in writing by the Agency.

REPORTING

Table 7

Parameters	Reporting Period or Date for reporting
Records 1-13, 15-17 from table 4	By 31 st January each year
Results from monitoring specified in Table 3	Each quarter. Results should be provided within two months of the end of that quarter